

US009636544B2

## (12) United States Patent Hong et al.

## (54) DIAMOND TYPE CAM FOR ROCK CLIMBING

(71) Applicant: **Seul-Min Hong**, Gyeongsangnam-do

(KR)

(72) Inventors: **Seul-Min Hong**, Gyeongsangnam-do

(KR); **Seong Hyeon Choe**, Ulsan (KR); **Sang-Kown Hong**, Gyeongsangnam-do

(KR); Sun-Gi Jung, Gyeongsangnam-do (KR); Seong-Hyeon Hong, Gyeongsangnam-do (KR)

(73) Assignee: **Seul-Min Hong**, Gyeongsangnam-do

(KR

(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 14/893,511

(22) PCT Filed: Dec. 1, 2014

(86) PCT No.: PCT/KR2014/011621

§ 371 (c)(1),

(2) Date: Nov. 23, 2015

(87) PCT Pub. No.: WO2015/088169

PCT Pub. Date: Jun. 18, 2015

(65) Prior Publication Data

US 2016/0129312 A1 May 12, 2016

(30) Foreign Application Priority Data

Dec. 13, 2013 (KR) ...... 10-2013-0155397

(51) Int. Cl.

**A47F 5/08** (2006.01) **A63B 29/02** (2006.01)

(Continued)

(10) Patent No.: US 9,636,544 B2

(45) **Date of Patent:** 

May 2, 2017

(52) U.S. Cl.

CPC ...... A63B 29/02 (2013.01); A63B 29/00 (2013.01); A63B 29/024 (2013.01); F16B 2/04

(2013.01); F16B 2/18 (2013.01)

(58) Field of Classification Search

CPC ........ A63B 29/024; A63B 29/00; A62B 1/04; A62B 1/00; F16B 2/04; F16B 2/18

See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

4,643,377 A \* 2/1987 Christianson ....... A63B 29/024

248/231.9

(Continued)

FOREIGN PATENT DOCUMENTS

EP 0226829 A1 7/1987 EP 1557202 A1 7/2005

(Continued)

Primary Examiner — Amy Sterling

(74) Attorney, Agent, or Firm — Farjami & Farjami LLP

## (57) ABSTRACT

A diamond type cam for rock climbing is provided, which includes a body having an operating member provided thereon, a slide member slidably coupled to the body, a plurality of extension cams each of which has one end that is rotatably coupled to the body and the slide member and an extended end portion that is rotatably hinge-coupled, and a plurality of wires each of which has one end that is coupled to a predetermined position of a lower portion of the extension cam and the other end that is rotatably coupled to a predetermined position of the slide member.

## 10 Claims, 6 Drawing Sheets

